

6/3/98

PC Code No: 128857

DP Barcode : D245572, D245535

MEMORANDUM

JUN 3 1998

SUBJECT: Section 18-Use of Myclobutanil on Cucurbits in Maryland

FROM: Kathryn Montague, Biologist *Kathryn V. Montague 5/18/98*
Thuy Nguyen, Chemist *Thuy Nguyen 5/18/98*
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

THRU: Daniel Rieder, Chief *Daniel Rieder 6/3/98*
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

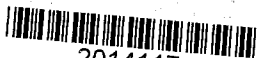
TO: Robert Forrest, PM 05
Registration Division (7505C)

A. Risk Characterization Summary

The proposed use of myclobutanil on cucurbits in Maryland does not appear to pose adverse effects to birds, mammals, fish, or aquatic invertebrates. Risk to nontarget plants could not be assessed due to lack of data; therefore, risk to plants remains a possibility, which could be minimized by taking precautions to minimize spray drift. Risk to nontarget insects could not be assessed due to lack of data; therefore, risk to nontarget insects remains a possibility from the proposed use of myclobutanil. Myclobutanil is relatively persistent, with an average field half-life of 129 days. The major route of dissipation is believed to be diffusion and dilution; myclobutanil appears to be resistant to most environmental breakdown processes.

B. Submission Purpose

The Maryland Department of Agriculture has applied for a special exemption to use Nova 40W fungicide containing myclobutanil on a total estimated 5,900 acres of cucurbit crops to treat powdery mildew (*Spaerotheca fuliginea*). The maximum estimate for total required active ingredient is 737.5 lb ai for the season. This is based on up to 2 applications of Nova 40 W at 2.5 oz. (0.0625 lb ai) per acre applied by ground sprayer at the first sign of disease. Applications are to be made with a 7-10 day treatment interval, with a 1 day interval prior to harvest. Applications will be made between July and September, 1998. Contact fungicides (copper, sulfur, chlorothalnil) are effective against powdery mildew at the site deposited; however, they are not systemic, and so do not provide adequate protection for the undersides of the leaves. The leaves die prematurely when the powdery mildew is not suppressed on the underside, resulting in lower yields for the crop. Registered systemic fungicides for powdery mildew control (triadimefon, benomyl, and thiophanate-methyl) are no longer effective due to resistance. There are no effective cultural practices which adequately control powdery mildew.



2014117

Product Information:**Product Name:** Rally 40 WSP manufactured by Rohm and Haas Co.**Active Ingredient:** Myclobutanil.....40%**Inert Ingredients**.....60%**C. Environmental Assessment****1. Environmental Fate and Exposure Characterization****TABLE I:** Summary of Selected Environmental Fate Properties for Myclobutanil

| Property | Range | Value used in assessment | Model |
|---|---|---|----------------------------|
| Solubility (water) | 142 mg/L | 142 mg/L | GENEEC |
| Hydrolysis $t_{1/2}$ | stable at pH 5, 7, and 9 | stable - (0 day) | GENEEC |
| Aquatic Photolysis $t_{1/2}$ | stable | stable - (0 day) | GENEEC |
| Aerobic Soil Metabolism $t_{1/2}$ | 61-71 days in silt loam, but degradation rates slowed after increasing aging, and after 240 days, 34-37% of parent was still present. | see Terrestrial Field Dissipation | GENEEC SCI-GROW |
| Terrestrial Field Dissipation $t_{1/2}$ | 292 days in sandy loam, 92 days in loam soil | 129 days = average of aerobic soil metabolism half-lives and terrestrial field dissipation half-lives | GENEEC SCI-GROW FATE |
| Anaerobic Soil Metabolism $t_{1/2}$ | no appreciable degradation in 62 days | not considered | |
| Aerobic Aquatic Metabolism $t_{1/2}$ | no data | (0 day) | |
| K_{ad} | 1.46, 2.39, 4.44, 7.08, 9.77 | see K_{oc} values | |
| K_{oc} | 224, 265, 581, 936 | 581 = median | GENEEC SCI-GROW |

2. Estimated Environmental Concentrations**Aquatic:**

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFED. This program uses a variety of environmental fate

parameters in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff.

GENEEC EECs (µg/L) for Myclobutanil Use on Cucurbits
INPUT VALUES

| RATE (#/AC) | APPLICATIONS | SOIL | SOLUBILITY | % SPRAY INCORP |
|--------------|--------------|-------|------------|-----------------|
| ONE(MULT) | NO.-INTERVAL | KOC | (PPM) | DRIFT DEPTH(IN) |
| .0625 (.125) | 2 7 | 581.0 | 142.0 | 1.0 0 |

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

| METABOLIC (FIELD) | DAYS UNTIL RAIN/RUNOFF | HYDROLYSIS (POND) | PHOTOLYSIS (POND-EFF) | METABOLIC (POND) | COMBINED (POND) |
|----------------------|---------------------------|----------------------|--------------------------|---------------------|--------------------|
| 129.00 | 0 | N/A | 0.00-0.00 | 0.00 | 0 |

GENERIC EECs (IN PPB)

| PEAK GEEC | AVERAGE 4 DAY GEEC | AVERAGE 21 DAY GEEC | AVERAGE 56 DAY GEEC |
|--------------|-----------------------|------------------------|------------------------|
| 3.67 | 3.61 | 3.32 | 2.92 |

Terrestrial--Acute

| Vegetation Type | Peak Maximum EEC ¹ | Average Maximum EEC ¹ |
|--------------------------|-------------------------------|----------------------------------|
| Short grass | 47 ppm | 36 ppm |
| Tall grass | 22 ppm | 17 ppm |
| Broadleaf plants/insects | 26 ppm | 20 ppm |
| Fruits/seeds | 3 ppm | 2 ppm |

¹From FATE program-- based on 2 applications at 2.5 oz product (0.06 lb ai)/A with a 7-day application interval. Initial concentration was the maximum Kenaga value for the vegetation type. Average EEC is for a 15-day period following the initial application.

Terrestrial--Chronic

| Vegetation Type | Peak Mean EEC ¹ | Average Mean EEC ¹ |
|--------------------------|----------------------------|-------------------------------|
| Short grass | 17 ppm | 13 ppm |
| Tall grass | 7 ppm | 5 ppm |
| Broadleaf plants/insects | 9 ppm | 7 ppm |
| Fruits/seeds | 1 ppm | 1 ppm |

¹From FATE program--based on 2 applications at 2.5 oz product (0.06 lb ai)/A with a 7-day application interval. Initial concentration was the mean Fletcher value for the vegetation type. Average EEC is for a 15-day period from the initial application.

3. Ecological Toxicity Data Summary

The following toxicity data has been reviewed in conjunction with registration of myclobutanil.

Terrestrial Wildlife Toxicity Data

| Common Name | %AI | Toxicity | NOEL | EPA-ID | CATEGORY |
|----------------|------|---------------------------------|---------|----------|----------|
| Bobwhite Quail | 84.5 | LD ₅₀ 510 mg/Kg | | 0144286 | C |
| Bobwhite Quail | 84.5 | LC ₅₀ >5000 ppm | | 0144287 | C |
| Mallard Duck | 84.5 | LC ₅₀ >5000 ppm | | 0144287 | C |
| Bobwhite Quail | 94.2 | LOEC >260 ppm | 260 ppm | 43087901 | S |
| Mallard Duck | 94.2 | LOEC >260 ppm | 260 ppm | 43087902 | S |
| Laboratory rat | 91.9 | Acute oral LD50=1360 g/kg | | 006370 | C |
| Laboratory rat | 84.5 | 2-gen. Repro LOEL=1000 ppm | 200 ppm | 004936 | C |
| Laboratory rat | 84.5 | 2-gen. Systemic LOEL=200 ppm | 50 ppm | 004936 | C |

Aquatic Organism Toxicity Data

| Common Name | %AI | Toxicity | NOEL | EPA-ID | Category |
|-------------------|------|----------------------------------|----------|----------|----------|
| Bluegill sunfish | 84.5 | 96 HR LC50=2.4 ppm | | 0144285 | C |
| Rainbow trout | 84.5 | 96 HR LC50=4.2 ppm | | 0141677 | C |
| Water flea | 84.5 | 48 HR EC ₅₀ =11 ppm | | 0141678 | C |
| Sheepshead minnow | 93 | 96 HR LC ₅₀ =4.7 ppm | | 42747903 | C |
| Eastern oyster | 93 | 96 HR EC ₅₀ =0.68 ppm | | 42747901 | S |
| Mysid | 93 | 96-HR LC50 = 0.24 ppm | | 42747902 | C |
| Fathead minnow | | Early life LOEC=2.2 ppm | 0.98 ppm | 0266119 | S |

4. Hazard Assessment

Terrestrial-Acute Risk Quotients (RQs)

| Vegetation Type | Peak Maximum EEC | Avian acute RQ---max | Mammal acute RQ--max ¹ |
|--------------------------|------------------|----------------------|-----------------------------------|
| Short grass | 47 | 0.01 | 0.03 |
| Tall grass | 22 | 0.00 | 0.02 |
| Broadleaf plants/insects | 26 | 0.00 | 0.02 |
| Fruits/Seeds | 3 | 0.00 | 0.00 |

¹Based on a calculated mammal LC50 of 1432 ppm for a small mammal consuming 95% of its BW (LD50/% BW consumed)

No acute levels of concern (LOCs) are exceeded for birds or mammals from the proposed use of myclobutanil on cucurbits.

Terrestrial-Chronic Risk Quotients

| Vegetation Type | Average Mean EEC ¹ | Avian Chronic RQ | Mammalian Chronic RQ: Reproductive Systemic |
|--------------------------|-------------------------------|------------------|---|
| Short grass | 13 ppm | 0.05 | 0.06 0.26 |
| Tall grass | 5 ppm | 0.02 | 0.02 0.10 |
| Broadleaf plants/insects | 7 ppm | 0.03 | 0.04 0.14 |
| Fruits/seeds | 1 ppm | 0.00 | 0.00 0.02 |

¹Average concentration over time (15 day period)--modeled using FATE program with mean Fletcher value as initial input.

No chronic LOCs are exceeded for birds or mammals from the proposed use of myclobutanil on cucurbits.

Hazard to Aquatic Organisms:

Acute RQs

| Species | LC ₅₀ or EC ₅₀ (ppm) | Peak EEC (from GENEEC) (ppm) | RQ |
|------------------|--|------------------------------|------|
| Bluegill sunfish | 2.4 | 0.004 | 0.00 |
| Rainbow trout | 4.2 | 0.004 | 0.00 |
| Water flea | 11 | 0.004 | 0.00 |

| | | | |
|-------------------|------|-------|------|
| Sheepshead minnow | 4.7 | 0.004 | 0.00 |
| Eastern oyster | 0.68 | 0.004 | 0.00 |
| Mysid | 0.24 | 0.004 | 0.02 |

No acute LOCs are exceeded for aquatic organisms from the proposed use of myclobutanil on cucurbits.

Terrestrial Organisms

Acute Risk: The maximum expected residue of myclobutanil in the environment is 47 ppm. This value was calculated using the FATE program, with an initial input of 24 ppm (the maximum "Kenaga" value of 240 ppm/1 lb ai/A for short grass x the application rate of 0.0625 lb ai/A). This produces acute risk quotients of 0.01 for birds and 0.03 for mammals, both of which are well below the high risk, restricted use, and endangered species levels of concern (LOCs).

Chronic Risk: Average mean residues of myclobutanil are expected to be 13 ppm or less for a 15-day period from the time of the first application. This value was calculated using the FATE program, with an initial input of 8.5 ppm (the mean "Fletcher" value of 85 ppm/1 lb ai/A for short grass x the application rate of 0.0625 lb ai/A). This results in risk quotients of 0.05 for birds and 0.26 for small mammals, which are below the LOC for chronic risk.

Aquatic Organisms

Acute: Toxicity endpoints for the species tested were compared to the peak EEC (0.004 ppm). RQs ranged from 0.00-0.02, which are well below and LOC for aquatic organisms.

Chronic: The fish early life-stage NOEC (0.98 ppm) was compared to the 56-day GENEEC value (0.003 ppm); no chronic hazard was indicated for the proposed use of myclobutanil on hops.

Hazard to Terrestrial Plants:

No data on toxicity of myclobutanil to terrestrial species of plants has been reviewed to date. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Hazard to Non-Target Insects Toxicity Data: No data has been received for review by the Agency regarding toxicity to non-target insects. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Endangered Species: There are no endangered species concerns indicated for birds,

mammals, fish, or aquatic invertebrates. Risk to nontarget plants and insects could not be assessed due to lack of data; therefore, the possibility of risk to endangered plant or insect species cannot be precluded. There are endangered plant species present in several counties in Maryland: Harperella (Allegany Co.), Swamp Pink (Anne Arundel, Cecil, and Dorchester Counties), Sandplain Gerardia (Baltimore Co.), Canby's Dropwort (Dorchester Co.), Sensitive Joint-vetch (Somerset Co.), and Northeastern Bulrush (Washington Co.).

D. Labeling Recommendations

Section 18 Label

Do not apply directly to water, or to areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwater or rinsates.

Product Label

For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.